

## A NEW SPECIES OF *PENAPHLEBIA* (EPHEMEROPTERA: LEPTOPHLEBIIDAE) FROM ARGENTINA<sup>1</sup>

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ABSTRACT: A new species of *Penaphlebia*, *P. exigua*, is described from southern Argentina. Diagnostic morphological characters of both nymph and imago are illustrated

Included in the mayfly collections of the senior author from Argentina are unusually small specimens of the genus *Penaphlebia* which represent a new species, *Penaphlebia exigua*, described herein. In the revision of the generic classification of certain Leptophlebiidae from southern South America, Peters and Edmunds (1972) listed four recognized species of *Penaphlebia*: *P. chilensis* (Eaton), *P. fulvipes* (Needham and Murphy), *P. sepia* (Thew), and *P. vinosa* (Demoulin). Pescador is presently revising the genus and additional species will be included in the genus.

### *Penaphlebia exigua*, new species (Fig. 1-9, 11)

**Male imago** (in alcohol). Length: body 6.4-6.9 mm, fore wings 6.5-7.0 mm. Head pale brown; a black stripe extends from compound eyes to base of antennae. Scape and pedicel of antennae pale yellow, flagellum paler. Ocelli grayish-white, black at base. Upper portion of eyes beige, lower portion grayish-black. Thorax: nota brown, pronotum paler, except margins black with 2 pairs of longitudinal submedian black stripes. Pleura and sterna brown. Wings (Fig. 1-3): membrane of fore wings hyaline, yellowish at extreme base; pterostigma translucent white; longitudinal and cross veins yellowish-brown, vein C, Sc, and R<sub>1</sub> darker; vein MP<sub>2</sub> of at least one of fore wings attached to vein CUA (Fig. 1); prepterostigmatic cross veins weakly developed; number of costal cross veins 17-20. Hind wings elliptic; membrane hyaline; longitudinal and cross veins yellowish-brown; number of costal cross veins 7-8. Legs: coxae, trochanters, tibio-femoral joints, and tarsal joints brownish-yellow, remaining segments yellow, progressively paler toward apex; femora with faint transverse black median band; segment 3 of protarsi longer than segment 4. Abdomen: terga translucent yellow with pronounced black maculae (Fig. 7) and black posterolateral markings thinly extended to posterior margins of segment. Sterna yellow; lateral margins on sternum 9 yellowish-brown. Genitalia (Fig. 4-6): forceps pale yellow, segment 1 faintly washed with brown, pronounced on inner lateral margin; basal 3/4 of inner margin of segment 1 moderately serrated, segments 2 and 3 subequal length. Styliiger plate yellow with shallow U-shaped posteromedian emargination. Penes pale yellow; subapical spine on penis lobe stubby and pointed posterolaterally (Fig. 5, 6); subapical lobe weakly developed (Fig. 5, 6). Caudal filaments: pale yellow with apical 1/3 of basal segments brown, brown portion progressively becoming

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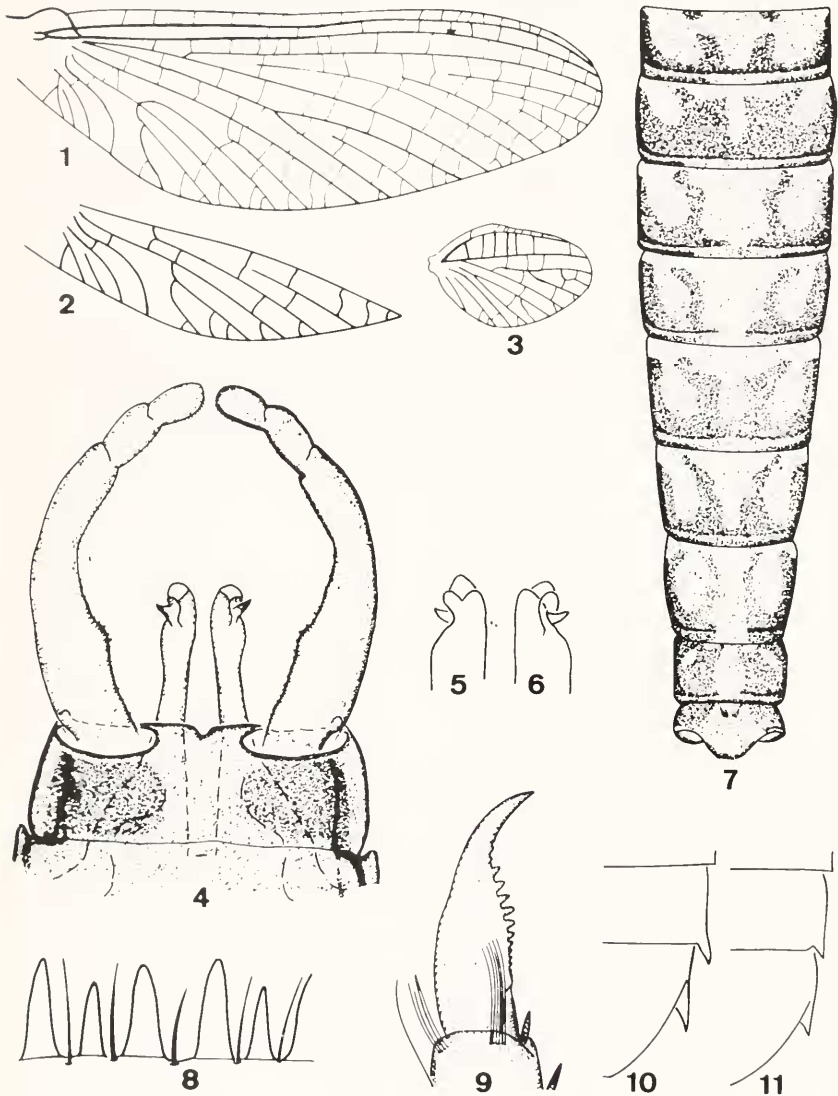


Fig. 1-9. *Penaphlebia exigua*. Fig. 1-7.  $\sigma$ imago: 1, fore wing, 2, variation in vein MP of fore wing; 4, genitalia, ventral; 5-6, dorsal (5) and ventral (6) detail of apex of penis lobe; 7, abdominal terga 2-10. Fig. 8-9, nymph: 8, posterior margin of abdominal terga; 9, fore claw. Fig. 10-11, posterolateral projections of abdominal segments 8-9 of nymph; ventral view: 10, *P. chilensis*; 11, *P. exigua*.

broader towards apex until filaments consist of alternating pale yellow and brown segments with brown segments gradually faded distally.

**Female imago** (in alcohol). Length: body 7.7 mm, fore wing 8.0 mm. Color and marking of head, antennae and ocelli as in male. Eyes black. Thorax: color and markings as in male. Wings: color of fore and hind wings as in male except veins darker, and costal and subcostal cross veins well developed. Abdomen: color slightly darker than male, markings similar (Fig. 7).

**Mature nymph** (in alcohol). Body length 6.9-7.2 mm. Dorsum of head pale brown, venter paler; small triangular pale yellow spot anterior to median ocellus and lateral to lateral ocelli. Scape and pedicel of antennae light brown, flagellum paler. Ocelli black. Eyes of female black. Upper portion of male eyes orange brown, lower portion black. Mouthparts: labrum with a transverse row of closely set hair near dorsoapical margin. Outer margin of mandibles smoothly curved, middorsal depression shallow to absent. Maxillary palpi uniformly yellow. Thorax: nota light brown, sterna paler; color markings on pronotum as in imagos. Legs: light brown; femora with broad transverse median and apical dark brown bands. Middenticles on claws larger than apical denticles (Fig. 9). Abdomen: terga yellowish-brown with black maculae as in imagos; terga 2-7 with midsublateral pale yellow spot; tergal posterior spines subequal length with hair-like setae (Fig. 8); posterolateral projections on abdominal segments 8 and 9 weakly developed (Fig. 11). Sterna pale yellow, anterior margin brownish. Gills: membrane grayish-white; tracheae black; lamellae terminated in a filamentous process. Caudal filaments: pale brown, with pronounced dark shiny brown annulation on every other articulations.

**Geographical Distribution.** Holotype ♂ imago, ARGENTINA: Rio Negro Prov., Rincon de Asconape, 70 km S V alcheta, 27-II-80, Willink, *et. al.* Allotype ♀ imago, same data as holotype. Paratypes: ARGENTINA: 19 ♂ imagos, 14 nymphs, same data as holotype.

Association of nymph and imagos is by color markings of nymphs and adults collected in same locality. Holotype, allotype, 9 ♂ imaginal and 7 nymphal paratypes are deposited in the collections of Fundacion Miguel Lillo, Miguel Lillo, Tucuman, Argentina. Ten ♂ imaginal and 7 nymphal paratypes are deposited in the collections of Florida A&M University.

**Etymology.** *exiguus*, L., meaning little.

**Discussion.** The nymphs of *P. exigua* exhibit minor variations on markings on the abdominal sterna, and the development of posterolateral projections on abdominal segments 8-9. Young nymphs have uniformly pale yellow abdominal sterna while mature ones have the anterior margin of each segment brownish, and anterior brown maculae on sternum 9. Additionally, mature nymphs have pronounced midsublateral pale yellow spots on terga 2-8, less pronounced or absent among the immature ones. Male nymphs have posterolateral projections of abdominal segments 8-9 more developed (Fig. 11) than the females.

Black maculae on abdominal terga 4 and 5 of most imagos are medially separated (Fig. 7) while a few have such maculae medially fused. Except for three ♂ imagos which have the base of vein MP<sub>2</sub> of one of the fore wings attached by a cross vein to vein MP<sub>1</sub> (Fig. 2), the rest have vein MP<sub>2</sub> basally fused or attached with vein CUA (Fig. 1).

*Penaphlebia exigua* can be distinguished from the other species of the genus by any of the following characters. In the imagos: (1) small body size having a length of 6.4-6.9 mm (male), 7.7 mm (female); (2) pattern of black maculae on abdominal terga is similar to Fig. 7; (3) vein  $MP_2$  of at least one of the fore wings is basally attached to vein CUA (Fig. 1); and (4) apex of penes is as in Fig. 5, 6. In the nymph: (1) body length ranges from 6.9-7.2 mm; (2) middle denticles on claws are larger than the apical denticles (Fig. 9); and (3) posterolateral projections on male abdominal segments 8-9 are weakly developed (Fig. 11) compared to the other species (Fig. 10).

**Biology.** The nymphs of *P. exigua* were collected in a small stream in Somuncura Plateau which supports a thick growth of *Nostoc* and moss. Along the edge of the stream are thick growths of *Cortaderia speciosa* Nees, *Samoulus valerandi* (L.), *Cynodon dactylum*, *Agrostis*, and ferns (Ceï, 1969).

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